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AN ENUMERATION OF THE WASHINGTON AND OREGON HEPATICAE COLLECTED BY MR. A. S. FOSTER, 1904-1909.

CAROLINE COVENTRY HAYNES.

This collection is in the Herbarium of the Sullivant Moss Society. It has given me much pleasure to determine these specimens collected by Mr. Foster at various times during the past six years. When I add that the great majority of them were found in full maturity, an idea of the value of the collection becomes evident. Thanks are due to Dr. Evans and Miss Lois Clark for verifying, and in several instances, correcting, my determinations.

Nardia obovata (Lyell) Carringt., and *Mylia anomala* (Hook.) S. F. Gray were, when collected, new to Washington.

The following species are generally found in colonies: *Radula complanata*, *R. Bolanderi*, *Scapania Bolanderi* and *Porella navicularis*, growing indifferently on live or decayed wood and rocks. *Riccardia latifrons*, *Scapania umbrosa*, *Lophozia incisa*, *Cepholozia lunulaefolia*, *C. bicuspidata*, *Lepidozia reptans* and *Calypogeia Trichomanis*, growing on old damp logs, shaded.

Ricciaceae.

1. RICCIOCARPUS NATANS (L.) Corda (terrestial form).

(344) On soil among stones in protected position below Wallula Gorge, Columbia River, Wash., Feb. 25, 1906. (757) In pond near Hoquian, Wash., May 20, 1908. Det. A. S. Foster.

Marchantiaceae.

2. TARGIONIA HYPOPHYLLA L.

(343) On soil among stones, always moist but with good drainage, Stoney Butte, alt. 500 ft. (East) Portland, Oregon, April 23, 1906. (488) On humus of rocks in crevices of bluffs, Cathlamet, Wash., Feb. 10, 1907.

3. ASTERELLA GRACILIS (Web f.) Underw.

(343) On soil among rocks, Stoney Butte, alt. 500 ft. Portland, Oregon, April 23, 1906. (513) On humus of ledges, bluff below Cathlamet, Wash., March 24, 1907.

4. CONOCEPHALUM CONICUM L.

On decaying log, forest back of Cathlamet, Wash., March 16, 1907.

5. MARCHANTIA POLYMORPHA L.

On wet banks, plentiful, Hamilton, Wash., Dec. 20, 1904, (412) In boggy place, cañon back of Rainier, Oregon, May 16, 1906. (516) Floating in ponds. or on mud of margins, Cathlamet, Wash., March 24, 1907. (Common along brooks in forests west of Cascades).

6. MARCHANTIA POLYMORPHA var. AQUATICA L.

(F 3) On end of log, in splash of a small "fall" near Rooster Rock, Bridal Veil, Oregon, Aug. 9, 1905. Det. Miss Clark.

Metzgeriaceae.

7. RICCARDIA LATIFRONS Lindb.

(A) On rotten logs with mosses and other hepatics, Hamilton, Wash.. Feb. 11, 1905. (X) On end of old log, Hamilton, Wash., April 1, 1905 (T in part) On end of log, roadside below ferry, Hamilton, Wash., April 15, 1905. (494) On decaying log, open forest, Cathlamet, Wash., Sept. 22, 1906.

8. RICCARDIA MULTIFIDA (L.) Carruth

(945) On trunks of shrubs. vine maples, alders etc. near Aberdeen, Wash., Feb. 18, 1909. (906 in part). On alders, bank of Wishkah River, near Aberdeen, Wash., Nov. 10, 1908.

9. RICCARDIA PALMATA (Hedw.) S. F. Gray

(927) End of rotten log, Aberdeen, Wash., Dec. 20, 1908. (911 in part) Aberdeen, Wash., Dec. 15, 1908.

10. RICCARDIA PINGUIS (L.) S. F. Gray

On cobbles, spring branch, dense timber, Biddle's Ranch, above Vancouver, Wash., June 18, 1905. Det. Dr. Evans.

11. RICCADIA SINUATA (Dicks.) Trevis.

(932 in part) On log, plants submerged, Sequalitchew Lake, near Takoma, Wash., June 6, 1906.

12. METZGERIA CONJUGATA Lindb.

(P) In crevice of rocks, protected, Merryette Falls, Hamilton, Wash., March 18, 1905. (S) On granite rock, deep shade, Iron Mountains, alt. 1800 ft. Hamilton, Wash., April 8, 1905. (W) On rock in timber of Cumberland Creek Cañon, Hamilton, Wash., April 15, 1905. (Z) On rock, Hamilton, Wash., April 15, 1905. (496) On rocks by roadside, Cathlamet, Wash., Sept. 30, 1906. (511) At base of alders. Cathlamet, Wash., March 5, 1907. (905b) On decaying stump, Aberdeen, Wash., Nov. 10, 1908. (944) On trunks of shrubs, vine maple, alders etc. in dense thickets, near Aberdeen, Wash., Feb. 18, 1909.

13. PELLIA EPIPHYLLA (L.) Lindb.

(514) On rotten "ties" old skid road, Cathlamet, Wash., March 22, 1907. Det. Miss Clark.

14. PELLIA NEESIANA (Gottsche) Limpr.

(514b) Side of decaying log, Birnie Creek, Cathlamet, Wash., March 6. 1907. Det. Dr. Evans. On wet ground, Aberdeen, Wash., March 20, 1909.

15 BLASIA PUSILLA L.

(g 3) On moist soil, bank of Willamette River, Magoon's Park, near Portland, Oregon, Aug. 7, 1905. (411) On soil under leaky flume, Rainier, Oregon, May 16, 1906. (887) Bluffs on bank of Wishkah River, Chehalis Co., Wash., Sept. 20, 1908.

Jungermanniaceae.

16. *MARSUPELLA EMARGINATA (Ehrh.) Lindb.

On boulders everywhere from 1500-3500 ft. alt. Mount Hood Region.

**Marsupella emarginata*, *Cephalozia leucantha*, *Frullania franciscana* and *Anthoceros fusiformis* were sent to Miss Clark and determined by her.

17. NARDIA CRENULATA (Smith) Lindb.

On wet banks, Hamilton, Wash., Dec. 20, 1904. Det. Dr. Evans, who "suspects that these specimens represent an aquatic or subaquatic form of above species." (N) On sandstone, roadside, Hamilton, Wash., April 29, 1905. (512) Cathlamet, Wash., March 2, 1907. (904b) On wall of sandstone bed-rock, near Aberdeen, Wash., Nov. 10, 1908. (932) Clayey soil, Wishkah River, Aberdeen, Wash., Feb. 16, 1909. (930) Clayey soil, in the open, Aberdeen, Wash , March 20, 1909.

18. NARDIA OBOVATA (Lyell) Carringt.

(Q) On sandstone, roadside, Hamilton, Wash., April 29, 1905.

19. GYROTHYRA UNDERWOODIANA M. A. Howe

(E No. 2) On rocks of bluff, below ferry, northern exposure, Hamilton, Wash , April 15, 1905. Det. Dr. Evans.

20. JUNGERMANNIA LANCEOLATA L.

(V in part) On wall of rocky bluff, below ferry, northern exposure, Hamilton, Wash., April 15, 1905. Det Dr. Evans.

21. JUNGERMANNIA ATROVIREXS (Schleich.) Dumort.

(888) On soft sandstone, Wishkah River bluff, near Aberdeen, Wash., Oct. 3, 1908.

22. LOPHOZIA INFLATA var. HETEROSTIPA (Huds.) Lindb.

(E in part) In sphagnum marsh, Hamilton, Wash., April 2, 1905. (E) In sphagnum swamp, three miles from Hamilton, Wash., Sept. 16, 1904. Det. Dr. Evans.

23. LOPHOZIA INCISA (Schrad.) Dumort.

(X in part) On end of old log, Hamilton, Wash., April 1, 1905. (Y) On old log in protected position, Hamilton, Wash., April 2, 1905. (S in part) On granite rock, deep shade, Iron Mountains, alt. 1800 ft. Hamilton, Wash., April 18, 1905. (2 B) On log, protected, Hamilton, Wash., May 12, 1905. (493) On decaying hemlock stump up river, Cathlamet, Wash., Feb. 10, 1907, (909) Rotten chunk, Aberdeen, Wash., Dec. 15, 1908.

24. LOPHOZIA OVATA (Dicks.) M. A. Howe

(J 2) On tree, Clatsop Beach, Seaside, Oregon, Aug. 20, 1905.

25. LOPHOZIA PORPHYROLEUCA (Nees) Schffn.

(J 2 in part) On tree, Clatsop Beach, Seaside, Oregon, Aug. 20, 1905.

26. LOPHOZIA VENTRICOSA (Dicks) Dumort.

(421) On humus of rocks in Cañon "Cloud Cap Inn" Mt. Hood, Oregon, alt. 7862 ft. July 26, 1906.

27. PLAGIOCHILA ASPLENIOIDES (L.) Dumort.

(J) On northern face, rocky bluff, Hamilton, Wash., Feb. 25, 1905. (H 2) On old log in shady timber, Magoon's Park, near Portland, Oregon, Aug., 1905 (416) On soil in shade, foot of bluffs, Southern Pacific Ry., Oregon City, Oregon, June 25, 1906.

28. MYLIA ANOMALA (Hook.) S. F. Gray

(E) In sphagnum marsh, Hamilton, Wash., April 2, 1905. Det. Dr. Evans.

29. LOPHOCOLEA CUSPIDATA (Nees) Limpr.
(H) On upturned root, Hamilton, Wash., March 10, 1905. (Etc. in part) On log in thicket, Hamilton, Wash., April 22, 1905. (342) On north side big stone, "Rocky Butte" (East) Portland, Oregon, April 23, 1906.

30. CHILOSCYPHUS PALLESCENS (Ehrh.) Dumort.
(J in part) On northern face bluff, Hamilton, Wash., Feb. 25, 1905. (W) On log across trout brook, Hamilton, Wash., April 1, 1905.

31. CHILOSCYPHUS POLYANTHUS (L.) Corda RIVULARIS Nees.
(F) On side of O. R. & N. Ry. near Latourelle Falls, Oregon, in ice cold water, (Note. Fresh water crustaceae devour this greedily.) Aug. 12, 1904. (932) Tacoma, Wash., June 6, 1908.

32. CEPHALOZIA BICUSPIDATA (L.) Dumort.
(A) On rotten logs with mosses, Hamilton, Wash., Feb. 11, 1905 (T) On end of log, Hamilton, Wash., April 15, 1905. (Etc.) On log in thicket, Hamilton, Wash., April 22, 1905. (495) On decaying chunk in slough on bluff, Cathlamet, Wash., Sept. 22, 1906. (910) End of log, Aberdeen, Wash., Dec. 15, 1908.

33. CEPHALOZIELLA DIVARICATA (Sm.) Dumort.
(408) On decaying log, Mt. Taber, Portland, Oregon. April 29, 1906. (947) On decaying logs, near Aberdeen. Wash., March 10, 1909.

34. CEPHALOZIELLA DIVARCATA var. SCABRA M. A. Howe
(409) On bluffs, near A. & C. Ry. above Rainier, Oregon, May 16, 1906.

35. CEPHALOZIA LEUCANTHA Spruce.
Sphagnum bog, near Westport, Wash., April 29, 1908. Det. Miss Clark.

36. CEPHALOZIA LUNULAEFOLIA Dumort.
(A in part) On rotten logs with mosses, Hamilton, Wash., Feb. 11. 1905. (Y in part) On old log in protected position, Hamilton, Wash., April 2, 1905. (X in part) On end of old log, Hamilton, Wash., April 1, 1905.

37. CEPHALOZIA PLENICEPS (Aust.) Lindb.
(I) On old log roadside, Hamilton, Wash., April 22, 1905.

38. CALYPOGEIA SUECICA (Arn. & Perss.) C. Müll.
(892) Decaying wood, Chehalis Co. Wash., May 28, 1908.

39. CALYPOGEIA TRICHOMANIS (L.) Corda
(2 B in part) On log, protected, Hamilton, Wash., May 12, 1905.

40. BAZZANIA TRICRENATA (Wahl) Trevis.
(H) On inside of rotten stump, Hamilton, Wash., Jan. 21, 1905. (I) On rotten log, Iron Mountains. Hamilton, Wash., Feb. 2, 1905. (O!) In slanting crevice of rocky bluff, moist, well protected, light supply one-half or less, Merryette Falls, Hamilton. Wash., March 18, 1905. (907) Trunk bark hemlock, Aberdeen, Wash., Nov, 30, 1908.

41. LEPIDOZIA REPTANS (L.) Dumort.
(Y in part) On old log in protected position, Hamilton, Wash., April 2, 1905. (952) Near Aberdeen, Wash , April 3, 1909.

42. BLEPHAROSTOMA TRICHOPHYLLUM (L.) Dumort.

(V) On wall of rocky bluff, northern exposure, Hamilton, Wash., April 15, 1905.

43. PTILIDIUM CALIFORNICUM Aust.

(R) On logs and at base of trees, Iron Mountains, Alt. 1800 ft. (Not found at foot of mountain.) Hamilton, Wash., April 8, 1905. Note. At the base of trees; alt. 1500–3500 ft. abundant at the higher elevation. (908) Old logs, in deserted claim, Aberdeen, Wash., Dec. 15, 1908.

44. DIPLOPHYLLEIA ALBICANS (L.) Trevis.

(B 2) On soil base of boulders, Iron Mountains, Hamilton, Wash., May 6, 1905.

45. DIPLOPHYLLEIA TAXIFOLIA (Wahl.) Trevis.

(B 2 in part) On soil base of boulders, Iron Mountains, Hamilton, Wash., May 6, 1905. (510) On soil, roadside, old mill, Cathlamet, Wash., March 12, 1907.

46. SCAPANIA BOLANDERI Aust.

(A in part) On rotten logs with mosses, Hamilton, Wash., Feb. 11, 1905. (K in part) Qn rotten log, Hamilton, Wash., March 13, 1905. On rocks in edge of trickling water, Hamilton, Wash., 1905. (Q) On end of rotten log. Hamilton, Wash., April 1, 1605. (413) On trunks of trees, coniferous woods, Rainier, Oregon, May 16, 1906. (911) On shady log, Aberdeen, Wash., Dec. 15, 1908.

47. SCAPANIA CURTA (Mart.) Dumont.

(421) On humus rocks in cañon "Cloud Cap Inn" Mount Hood, Oregon, at 7862 ft. alt., July 26, 1906.

48. SCAPANIA NEMOROSA (L.) Dumort.

(N) On rocks, in tufts, Merryette Falls, Hamilton, Wash., March 18, 1905. (I in part) On rotten log, side of Iron Mountain. "Fissidens Cascade" Hamilton, Wash., Feb. 2, 1905. (497½) On humus in open forest, Cathlamet, Wash., Oct. 20, 1906.

49. SCAPANIA DENTATA Dumort. var. OAKESII Aust.

(M) In tufts on rocks, Merryette Falls, Hamilton, Wash., March 18, 1905.

50. SCAPANIA UMBROSA (Schrad.) Dumort.

(X in part) On end of old log, Hamilton, Wash., April 1, 1905. On leaning alder, deep shade, Cathlamet, Wash.. March 30. 1907. (911 in part) On log, shady, Aberdeen, Wash., Dec. 15, 1908.

51. SCAPANIA UNDULATA (L.) Dumort.

(L in part) On shrubs along slough, quite wet, Hamilton, Wash., Feb. 25, 1905. (g No. 2) On bank of river below ferry, in edge of stream, Hamilton, Wash., April 15, 1905.

52. RADULA BOLANDERI Gottsche

(929 and 945 B) Aberdeen, Wash., March 13, 1909. (A in part) On rotten logs with mosses Hamilton, Wash., Feb. 11, 1905. (497) Bark of

young spruce, bluffs below Cathlamet, Wash., Sept. 23, 1906. (511 in part) At base of alders, Cathlamet, Wash., March 5, 1907. (492b) Cathlamet, Wash., Jan. 26, 1907.

53. RADULA COMPLANATA (L.) Dumort.

(K) On rotten log in shelter, Hamilton, Wash., March 13, 1905. (No. C 2) On vine maple, near Town Hall, Hamilton, Wash., May 24, 1905. (492 C) On willow in swampy tide-flat below Cathlamet, Wash., Oct. 29, 1906. (492) On bark of alder trees, open woods, Cathlamet, Wash., Feb. 16, 1907.

54. PORELLA NAVICULARIS (Lehm. et Lindenb.) Lindb.

(C) On trees, brush, etc abundant, Hamilton, Wash., Oct. 20, 1904. (Abundant everywhere west of the Cascades, Foster). (931) On shrubs, in thickets, Aberdeen, Wash., March 20, 1909. Another specimen collected same locality, March 13, 1909. These two last mentioned specimens show this species possessing the modification due, Dr. Howe believes, to the influence of an epiphytic fungus. "The leaves were *bilobed* rather than *bipartite*, the union of the lobes resembling that of *Lejeunea* or *Radula*. The ventral lobes were shortened so that their longer axils was nearly parallel to the dorsal lobe and were conspicuously inflated as in most of the *Lejeuneae*. The underleaves were also shortened and often ventricose." For fuller details see Howe: The Hepaticae and Anthocerotes of California, page 168. This Washington species was found growning with *Radula complanata* and *Radula Bolanderi*, a fact Dr. Howe mentions in connection with those found in California.

55. PORELLA RIVULARIS (Nees) Trevis.

(L) On shrubs along slough, quite moist, Hamilton, Wash., Feb. 25, 1905. On leaning alder, deep shade, Cathlamet, Wash., March 30, 1907. Det. Miss Clark. (931) On shrubs in thicket, Aberdeen, Wash., March 20, 1909.

56. PORELLA ROELLII Steph.

(339) On ledge of loose stones, McCleay Cañon, Portland, Oregon, April 9, 1906. (340) On rocks in shade, high bluffs, Oregon City, Oregon, April 16, 1906. (K 2) On basaltic bluff overlooking Bridal Veil Falls, 80 ft. high, Bridal Veil, Oregon, 28 miles from Portland, Oregon, by O. R. & N. Ry. up Columbia River, Aug. 9, 1905.

57. FRULLANIA BOLANDERI Aust.

(702) On trunk of *Populus tremuloides*, Henry Island, facing "Canal de Haro" Puget Sound, Wash., July 11, 1907. Det. Miss Clark.

58. FRULLANIA CALIFORNICA Aust.

(341) On porphyritic wall, northern exposure, Cliffs, "Stoney Butte" (East) Portland, Oregon, April 23, 1906.

59. FRULLANIA FRANCISCANA M. A. Howe

On *Pinus contorta*, Westport, Wash., April 15, 1908. Det. Miss Clark.

60. FRULLANIA NISQUALLENSIS Sulliv.

(D) On trees, shrubs. etc. not abundant, Hamilton, Wash., March 11-20, 1904. (J 26) On trees, Oregon, Aug. 20 1905. (497 in part) Bark of young spruce, bluffs below Cathlamet, Wash., Sept. 23, 1906. (515) On bark of tree trunks, chunks, sometimes on rocky face of wall, Cathlamet, Wash., abundant, Jan. 20, 1907. (410) On live hemlock, hills back of Rainier, Oregon, May 16, 1906. (806) Alders back of Wishkah River near Aberdeen, Wash., Nov. 10, 1908. Another specimen, same locality, March 13, 1909.

Anthocerotaceae.

61. ANTHOCERSO PEARSONI M. A. Howe

(407) On *Pinus contorta*, Clatsop Beach, Seaside, Oregon, Aug. 19, 1905.

62. ANTHOCEROS PUNCTATUS L.

On soil in Cañon, Balch Creek Road, Portland, Oregon, July 3, 1905. Det. A. S. Foster.

63. ANTHOCEROS FUSIFORMIS Aust.

Clay soil cuts, Carson Heights, Portland, Oregon, June, 1906. Det. Miss Clark, Highlands, New Jersey.

LICHEN NOTES No. 11.

Describing Parmelia endoxantha, a new species; Parmelia olivacea multisporum, a new combination; and three little known Parmelia species hitherto inadequately diagnosed.

G. K. MERRILL.

PARMELIA SULFURATA Nees et Flot. in Linnaea, 1834 p. 501.

Reaction K^{+}_{+} fulvescent, C^{-}_{+} but faintly.

Thallus glaucescent, ashy-white or whitish, expanded, orbicular, loosely appressed, lobed, divisions irregularly developing with more or less recurved ascendant borders, peripherally the lobes rather more depressed and broader, with the margins entire or crenate; destitute of cilia, centrally thinly isidiose, rarely subglobose sorediate marginally; above somewhat shining or nearly opaque, and here and there complicate-rugulose; within yellow or whitish-sulphureous; below black and interruptedly short-rhizinose centrally, but broadly glabrous or yellowish-brown at the circumference. Apothecia cup-shaped, pedicellate, medium, disk yellowish-red, the margin faintly erose-crenulate. Spores 20-26 × 9-12μ

On trunks of forest trees.

Examined from Tampico, Mexico, C. G. Pringle, and Island of Jamaica, Miss C. E. Cummings. Variously reported from our Southern States and the West Indian Islands. The species somewhat resembles *P. cristifera* Tayl. and *P. corralloidea* (Mey & Flot.) Wain., and in its sorediate conditions is sufficiently like *P. perlata* of Tuckerman's conception to be readily